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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,755	04/09/2004	Kevin D. Belfield	UCF-385	3191
23717 7590 07/13/2007 LAW OFFICES OF BRIAN S STEINBERGER 101 BREVARD AVENUE COCOA, FL 32922				
			EXAMINER ANGEBRANDT, MARTIN J	
			ART UNIT 1756	PAPER NUMBER
			MAIL DATE 07/13/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/821,755	Applicant(s) BELFIELD, KEVIN D.	
	Examiner Martin J. Angebrannt	Art Unit 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected..
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/9/07</u> . | 6) <input type="checkbox"/> Other: _____ |

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1. The disclosure is objected to because of the following informalities: On page 7 at line 12, "fluorine" should read - - fluorene- - (see dyes of figure 8). Also on page 6 at lines 11-12, the application number should be replaced by the US patent number (7,001,708).

Appropriate correction is required.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

"fluorine" should read - - fluorene- - in claim 6 (see figure 8)

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Fleming et al. WO 01/96959.

Fleming et al. WO 01/96959 teaches in examples 2 and 3 a photosensitive composition comprising a polystyrene-acrylonitrile binder, diphenyliodonium hexafluorophosphate (a photoacid generator) and bis[4-(diphenylamino)styryl]-1,4-(dimethoxy)benzene (a two photon dye) coated to a thickness of 60 microns written upon using a Ti:sapphire operating at 800 nm with a 100 fs pulsewidth (pages 49-53) to write data in the overlap of approximately 10 microns (48/8). The use of fluorene dyes is disclosed on page 28. The formation of layers as thick as 100 mm is disclosed (8/13)

The claims rejected under this heading

7.

8.

9.

10.

11.

12. Claims 1-7,9,10 and 15-17 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001).

The coating of 2-3 microns films of fluorene dye 1 (shown in figure 1, page 283) with a photoacid generator and polystyrene or PMMA as the binder, where multilayer assemblies are formed by placing a cover slip between two previously coated cover slips. (page 285). The use of a Ti:sapphire laser tuned to 800 nm with a 115 fs pulsewidth where the beams is focused into one of the layers to record either in channel 1 (green, 510-550 nm photomultiplier tube detection) or channel 2 (red, 585-610 nm photomultiplier detection) (page 286). The use of two photon writing and readout in a single film of the photosensitive mixture with a laser confocal microscope system is also disclosed. (pages 287-288, figure 9) This exposure is held to inherently form exposures, which are submicron. The use of 740 nm femtosecond pulses is disclosed in the abstract.

13. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001), in view of Glushko et al. '671 and Fourkas et al. '063.

Glushko et al. '671 teach the formation of fluorescent multilayered optical recording media illustrated in figures 12-18. The formation of "100 or more" layers is specifically disclosed. (9/17-20).

Fourkas et al. '063 teach the variation in the power and duration to control the data bit size. [0025]. The media can be can be doped into a porous medium or coated as a multilayered form with spacers between the layers. [0043]

It would have been obvious to one skilled in the art to modify the two layer embodiment exemplified by over Belfield et al. "Three dimensional two photon imaging in polymeric

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materials” Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001) by adding other layers of to 100 or more with spacers based upon the teaches of Glushko et al. ‘671 and Flourkas et al. as each layer will increase the information density of the medium.

14. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belfield et al. “Three dimensional two photon imaging in polymeric materials” Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001), in view of Glushko et al. ‘671 and Fourkas et al. ‘063, further in view of Rentzepis et al. ‘031 and Tanaka et al. “Rapid sub-diffraction limit laser micro/nano processing in a threshold material system”, Appl. Phys. Lett., Vol. 80(2) pp. 312-314 (01/2002).

Rentzepis et al. ‘031 teach 100 planes of data [0010]. The use of 3D media which are a cube (1 cm^3 or a disk 1.25 cm thick and 8 cm in diameter where plane of data 20 microns thick. [0145] $1.25\text{ cm} = 12500\text{ microns}$. Which yield approximately 312 (20 micron thick) data layers with an equal thickness of material (20 microns) separating these planes.

Tanaka et al. “Rapid sub-diffraction limit laser micro/nano processing in a threshold material system”, Appl. Phys. Lett., Vol. 80(2) pp. 312-314 (01/2002) teaches the formation of sub microns features (down to 120 nm) using two photon excitation processes with a Ti:sapphire operating at 780 nm and 150 fs pulsewidth. (page 312). (Note instant specification and prepub at page 10)

To further support the position that submicron features can be written and that more than 300 layers can be formed, the examiner cites Rentzepis et al. ‘031 which teaches the formation of planes of data with thicknesses of 20 microns and media having thicknesses of 1 cm or 1.25 cm and the teachings of Tanaka et al. “Rapid sub-diffraction limit laser micro/nano processing in a

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threshold material system”, Appl. Phys. Lett., Vol. 80(2) pp. 312-314 (01/2002) which establishes that submicron features can be made/recorded and establishes that the desired variation in bit size taught by Fourkas et al. ‘063 embraces the 0.576 micron (576 nm) size recited in claim 22. The applicant bears the burden of showing the unobvious benefit arising from this bit size.

15. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

16. Claims 3-22 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,001,708, in view of Belfield et al. “Three dimensional two photon imaging in polymeric materials” Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001), in view of Glushko et al. ‘671 and Fourkas et al. ‘063.

Claims 1-4 of U.S. Patent No. 7,001,708 recite a fluorene two photon dye, a binder and photoacid generator.

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It would have been obvious to one skilled in the art to the invention of claims 1-4 of U.S. Patent No. 7,001,708 by forming multiple recording layers of to 100 or more with spacers based upon the teaches of Glushko et al. '671 and Flourkas et al. as each layer will increase the information density of the medium with a reasonable expectation of success given the exemplification of two layers by Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001).

17. Claims 1-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 and 17-21 of copending Application No. 11/256552 in view of Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001), in view of Glushko et al. '671 and Fourkas et al. '063.

Claims 1-15 and 17-21 of copending Application No. 11/272189 recite a fluorene two photon dye, a binder and photoacid generator and methods of exposure.

It would have been obvious to one skilled in the art to the invention of claims 1-15 and 17-21 of copending Application No. 11/272189 by forming multiple recording layers of to 100 or more with spacers based upon the teaches of Glushko et al. '671 and Flourkas et al. as each layer will increase the information density of the medium with a reasonable expectation of success given the exemplification of two layers by Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001).

This is a provisional obviousness-type double patenting rejection.

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18. Claims 3-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 and 17-21 of copending Application No. 11/272189 in view of Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001), in view of Glushko et al. '671 and Fourkas et al. '063.

Claims 6 and 30 of copending Application No. 11/256552 recite a fluorene two photon dye, a binder and photoacid generator.

It would have been obvious to one skilled in the art to the invention of claims 6 and 30 of copending Application No. 11/256552 by forming multiple recording layers of to 100 or more with spacers based upon the teaches of Glushko et al. '671 and Fourkas et al. as each layer will increase the information density of the medium with a reasonable expectation of success given the exemplification of two layers by Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001).

This is a provisional obviousness-type double patenting rejection.

19. Claims 3-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 29-30 of copending Application No. 11/707553 in view of Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001), in view of Glushko et al. '671 and Fourkas et al. '063.

Claims 29-30 of copending Application No. 11/707553 recite a fluorene two photon dye, a binder and photoacid generator.

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It would have been obvious to one skilled in the art to the invention of claims 29-30 of copending Application No. 11/707553 by forming multiple recording layers of to 100 or more with spacers based upon the teaches of Glushko et al. '671 and Flourkas et al. as each layer will increase the information density of the medium with a reasonable expectation of success given the exemplification of two layers by Belfield et al. "Three dimensional two photon imaging in polymeric materials" Proc. SPIE vol. 4459 pp. 281-289 (01/2002) or the corresponding presentation (July 2001).

This is a provisional obviousness-type double patenting rejection.

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cumpston et al '228 teaches the use of an Ti:sapphire laser operating at 730 nm in a two photon polymerization process.

Hesselink et al. '148 teach the multilayered recording media which do no have separation layers.

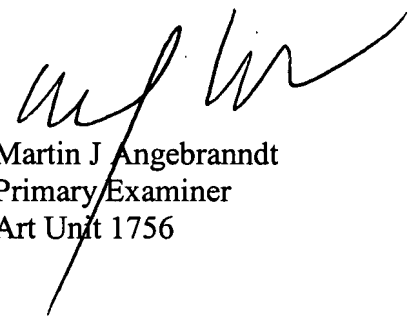
21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebranndt whose telephone number is 571-272-1378.

The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Martin J. Angebranndt
Primary Examiner
Art Unit 1756

6/21/2007